UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF PUERTO RICO

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
COMUNIDADES UNIDAS CONTRA LA CONTAMINACION	)	
	)	
Plaintiff-Intervenor	)	
	)	
v.	)	**CIVIL ACTION NO. 93-2527 CCC**
	)	
PUERTO RICO ELECTRIC POWER AUTHORITY,	)	
	)	
Defendant.	)	

CONSENT DECREE MODIFICATION

WHEREAS, plaintiff, United States of America, on behalf of the United States Environmental Protection Agency ("EPA"), entered into a Consent Decree in this matter (Docket No. 93-2527-CCC) with defendant, Puerto Rico Electric Power Authority ("PREPA"). The Consent Decree was entered by the United States District Court on March 19, 1999 (as entered by the District Court, the "Consent Decree"). Entry by the District Court was affirmed by the United States Court of Appeals for the First Circuit on February 25, 2000.

WHEREAS, the Consent Decree provides for the use of EPA Reference Method 9 ("Method 9") in performing visible emissions readings at sixteen existing Generating Units at PREPA Power Plants (the "Units") so as to determine compliance of the Units with Rule 403 of the Puerto Rico Regulations for the Control of Atmospheric Pollutants ("Rule 403") and to determine compliance with the Consent Decree.

WHEREAS, the United States and PREPA (the "Parties") dispute how Method 9 should be interpreted and implemented in performing visible emissions readings at the Units (the "Method 9 Dispute").

WHEREAS, the Parties disputed whether "repetitious, egregious, or persistent" violations of Rule 403 occurred between March 1999 and November 1999 at electrical generating Units 5 and 6 located at the PREPA South Coast Plant (the "REPs Dispute")(together with the Method 9 Dispute, the "Disputes").

WHEREAS, pursuant to the Consent Decree, on November 5, 1999, EPA issued a Notice of Dispute Resolution Determination Regarding the Proper Implementation of EPA Reference Method 9 and the Proper Establishment of Optimal Operating Ranges (the "EPA Method 9 Determination").

WHEREAS, pursuant to the Consent Decree, on November 22, 1999 PREPA filed with the United States District Court a Petition for Dispute Resolution contesting the EPA Method 9 Determination.

WHEREAS, pursuant to the Consent Decree, on February 2, 2000, EPA issued a Notice of Dispute Resolution Determination Regarding Recurring, Egregious or Persistent Violations of Rule 403 of Puerto Rico Regulations for the Control of Atmospheric Pollution of the Commonwealth of Puerto Rico ("PRRCAP") at the South Coast Plant (the "EPA REPs Determination").

WHEREAS, pursuant to the Consent Decree, on February 28, 2000, PREPA filed with the United States District Court a Petition for Dispute Resolution contesting the EPA REPs Determination.

WHEREAS, the Parties and Comunidades Unidas Contra La Contaminacion ("CUCCo") filed various motions and other submissions with the Court concerning the Disputes.

WHEREAS, since entry of the Consent Decree, EPA issued Notices of Violations of the Clean Air Act to PREPA (the "NOVs") which notified PREPA that EPA determined that PREPA had violated Rule 403 at certain PREPA Units.

WHEREAS, on October 15, 1999, EPA issued a Demand for Payment of Stipulated Penalties relating to alleged visible emissions violations during the period from April 20, 1999 through October 13, 1999.

WHEREAS, the Parties and CUCCo have met and in good faith sought to negotiate a resolution of the matters described in Paragraph 2 hereof. That resolution is embodied in this Modification. It includes provisions addressing concerns raised by CUCCo during the negotiation sessions.

WHEREAS, the Parties, without conceding their respective positions, and without further litigation, have resolved the matters described in Paragraph 2 hereof.

WHEREAS, nothing in this Modification is intended to impact or affect in any way any criminal proceedings or criminal plea agreement.

WHEREAS, the Parties agree, without adjudication or admission of facts or law, that the settlement embodied in this Modification is in the public interest and that entry of this Modification without further litigation is an appropriate resolution of the matters described in Paragraph 2 hereof, and the Parties consent to the entry of this Modification.

WHEREAS, this Modification is a modification of the Consent Decree, it is fully incorporated into the Consent Decree and enforceable by the Court, and only where it is specified does it modify existing terms of the Consent Decree.

NOW, THEREFORE, it is hereby ordered, adjudged, and decreed as follows:

I. JURISDICTION

1. The Court has jurisdiction over the subject matter of this action and over the Parties to this Modification pursuant to Paragraphs 30 and 133 of the Consent Decree.

II. OBJECTIVES

2. It is the express purpose of the Parties entering into this Modification to resolve: the Demand for Payment of Stipulated Penalties issued by EPA on October 15, 1999; the Notice of Dispute Resolution Determination Regarding the Proper Implementation of EPA Reference Method 9 issued by EPA on November 5, 1999; the Petition for Dispute Resolution contesting EPA's November 5, 1999 Determination filed by PREPA on November 22, 1999; the Notice of

Dispute Resolution Determination Regarding Recurring, Egregious or Persistent Violations of Rule 403 of Puerto Rico Regulations for the Control of Atmospheric Pollution of the Commonwealth of Puerto Rico ("PRRCAP") at the South Coast Plant issued by EPA on February 2, 2000; the Petition for Dispute Resolution contesting EPA's February 2, 2000 Determination filed by PREPA on February 28, 2000; the various motions and other submissions concerning these disputes filed by both Parties as well as CUCCo; the NOVs; and all environmental civil claims for violations of Rule 403 known and/or reported to EPA prior to the date of lodging of this Modification. This does not include payments of Stipulated Penalties that PREPA is required to pay pursuant to the "self-assessed" requirement of Section XIV of the Consent Decree.

3. It is also the objective of the parties to resolve, through this Modification, claims of the United States for only environmental civil penalties and/or injunctive relief concerning the matters described in Paragraph 2 hereof.

III. METHOD 9 OPACITY READINGS

4. PREPA agrees that from the date of lodging of this Modification, with regard to any PREPA residual (i.e. #4, 5, or 6) fuel oil-fired generating units, including those units not subject to the Consent Decree, PREPA will (a) apply the EPA Interpretation (as summarized in Paragraph 5 below and as detailed in the November 5, 1999 EPA Method 9 Determination) when taking visible emission readings as required by the Consent Decree, and (b) not contest the EPA Interpretation in any administrative, judicial or other proceedings. Also, to the extent that PREPA voluntarily performs any visible emissions readings required by this Modification prior to the lodging of this Modification with the Court, PREPA agrees that it will apply the EPA Interpretation when taking such visible emission readings.

5. The EPA Interpretation of Method 9 maintains that visible emission opacity observations shall be made, in accordance with the language of Method 9, "at the point of greatest opacity in that portion of an emission plume where condensed water vapor is not present." And that, as it stated in its Method 9 Determination:

> The generally white colored plumes emitted and potentially emitted from PREPA's stacks are not detached steam plumes, nor condensed water plumes. These plumes are

composed of sulfuric acid at significant concentrations. The sulfuric acid is a condensate in mist form. These types of plumes are called secondary plumes, because they generally form outside the stack when a gaseous component of the stack exhaust condenses into visible droplets or mist form. The point at which maximum opacity typically occurs is a few stack diameters downwind of the stack because it takes a certain amount of time for maximum condensation of the sulfuric acid mist to occur. The proper point to take all Method 9 VE readings of such a sulfuric acid mist plume, including the ones taken to establish Optimal Operating Ranges pursuant to the Consent Decree, is the point of greatest opacity.

6. The obligations set forth in Paragraph 4 above pertaining to the EPA Interpretation are the only obligations imposed by either the Consent Decree or this Modification on residual (i.e. #4, 5, or 6) fuel oil-fired generating units, other than the "Units."

7. PREPA reserves the right to (a) dispute any interpretation of Method 9, whether by EPA or any other party, other than the EPA Interpretation set forth above, and (b) dispute whether any given Method 9 visible emissions reading has been properly performed.

8. Any determination of compliance with opacity limitations shall be made considering all exemptions, exclusions, limitations and qualifications contained in the Consent Decree and in Federal and Commonwealth law and regulations.

9. The Parties agree that certain Pollution Control Equipment, such as wet scrubbers and wet electrostatic precipitators, installed pursuant to Paragraph 11 below, by the nature of their intended design may introduce water vapor into the stack gases and therefore may change the appearance of the plumes emitted from stacks controlled by such Pollution Control Equipment. Consequently, the use of such equipment may alter the point within such plumes where Method 9 visible emissions readings should be taken.

IV. FUEL OIL SULFUR CONTENT

10. For PREPA's South Coast Plant (Units 5 and 6) and PREPA's Aguirre Plant (Units 1 and 2), PREPA agrees to abide by the following schedule for the use of fuel oil in these Units: (a) until February 28, 2005, PREPA shall use fuel oil with a sulfur content of no more than 1.0%; (b) commencing March 1, 2005, PREPA shall use fuel oil with a sulfur content of no more than 0.75%; and (c) except as provided below in Paragraph 11 below, commencing March 1, 2007, PREPA shall use fuel oil with a sulfur content of no more than 0.50%.

11. PREPA may install Pollution Control Equipment (as defined below) on any one or more of South Coast Units 5 and 6 and Aguirre Units 1 and 2. If PREPA demonstrates to EPA through Performance Testing (as defined in Paragraph 13 below) of such Unit(s) that by use of the Pollution Control Equipment such Unit(s) achieve(s) "Consistent Compliance" (as determined by EPA pursuant to Paragraph 15) with the requirements of Rule 403 and the Consent Decree (i.e., opacity and Paragraphs 12 and 13 below), then, for each such Unit, PREPA may use fuel (oil or otherwise) with a sulfur content higher than allowed under Paragraph 10 above (as otherwise permitted by applicable law), to be implemented under a reasonable transition schedule to be approved by EPA, so long as PREPA continues to achieve Consistent Compliance with the requirements of Rule 403 and the Consent Decree. If, for any given Unit, the Performance Testing does not demonstrate that by use of the Pollution Control Equipment such Unit achieves Consistent Compliance with the requirements of Rule 403 and the Consent Decree, then PREPA shall continue to use, for such Unit, fuel oil with a sulfur content of no more than 0.50%, until such a demonstration is subsequently made. PREPA may attempt to demonstrate the achievement of Consistent Compliance using Pollution Control Equipment notwithstanding any failure to have made such a demonstration on one or more prior occasions.

12. "Pollution Control Equipment" shall mean emission control equipment that addresses the opacity of the plumes and achieves a reduction in sulfur oxides from PREPA emissions such that the amount of sulfur oxides emitted in pounds per million British thermal unit(s) ("lbs/MMBtu") while operating such equipment is equal to or less than the amount of sulfur oxides emitted when the respective PREPA Generating Unit is combusting a fuel oil with a sulfur content of 0.50%.

13. "Performance Testing" shall mean the testing of Pollution Control Equipment, using one or more fuels of PREPA's choice that are compatible with the Pollution Control Equipment, in compliance with all applicable permitting obligations, engineering requirements and law and regulation. In order to ensure that the reduction of sulfur oxides while using Pollution Control Equipment is equal to or greater than that achieved through the use of 0.50% sulfur fuel alone, as part of Performance Testing PREPA shall make available data demonstrating

the average higher heating value in Btu per pound ("Btu/lb") of fuel oil with a sulfur content of no more than 0.50% and the higher heating value (Btu/lb) of such fuels of PREPA's choice that are used during the Performance Testing. Performance Testing shall be conducted within ninety (90) days of start up of the Pollution Control Equipment.

14. PREPA shall use a fuel with a sulfur content of no more than 1.0% at South Coast Units 1 through 4 if PREPA demonstrates to EPA that those Units achieve Consistent Compliance with the requirements of Rule 403 and the Consent Decree when using that fuel oil. Unless and until PREPA makes such a demonstration, PREPA shall use fuel oil in accordance with the following schedule: (a) until February 28, 2005, PREPA shall use fuel oil with a sulfur content of no more than 1.0%; (b) commencing March 1, 2005, PREPA shall use fuel oil with a sulfur content of no more than 0.75%; and (c) commencing March 1, 2007, PREPA shall use fuel oil with a sulfur content of no more than 0.50%.

15. In determining whether the degree of compliance by PREPA constitutes Consistent Compliance, EPA reserves the right to exercise its discretionary authority, but EPA shall consider applicable industry standards and EPA technical and enforcement policy and guidance. PREPA reserves the right to dispute whether EPA has properly determined whether the degree of compliance achieved by PREPA constitutes Consistent Compliance.

16. At PREPA's Palo Seco facility, PREPA shall continue using fuel oil with a sulfur content of no more than 0.50% through July 18, 2009.

17. At PREPA's San Juan facility, PREPA shall continue using fuel oil with a sulfur content of no more than 0.50% until the earlier of (a) July 18, 2009 or (b) the issuance of a permit or permits by either EPA or the Puerto Rico Environmental Quality Board ("EQB") containing a condition that provides for use of fuel oil with a sulfur content of no more than 0.50%, at which time PREPA shall be subject to said permit condition instead of this Paragraph 17 of this Modification.

18. If PREPA chooses to install Pollution Control Equipment, EPA agrees to coordinate with PREPA to ensure reasonably prompt review and consideration of permit applications for any EPA permits that may be necessary for such Pollution Control Equipment.

V. OPTIMAL OPERATING RANGES

19. PREPA shall revise and, if necessary, modify the current Optimal Operating Ranges ("OORs") for the Units, in conformance with the procedures required by the Air Compliance Attachment of the Consent Decree.

20. It is understood that PREPA intends to perform the revisions and, if necessary, modifications of the OORs in coordination with PREPA's Conservation Program. The OOR revisions and, if necessary, modifications shall be completed for four (4) Generating Units by June 30, 2004, an additional six (6) Generating Units by December 31, 2004 and the remaining six (6) Generating Units by June 30, 2005.

21. PREPA shall notify EPA, CUCCo, and the Environmental Review Contractor at least two weeks prior to any OOR testing. Notwithstanding the foregoing sentence, in the event that OOR testing is re-scheduled due to weather conditions, third-party contractor scheduling considerations, operational considerations, or any other justifiable reason determined by PREPA to necessitate such re-scheduling, and such re-scheduling occurs within two weeks of the date on which the re-scheduled testing is to commence, then PREPA shall notify EPA, CUCCo, and the Environmental Review Contractor promptly of the justification for such a change and of the re-scheduled date, but PREPA shall not be required to provide two weeks advance notice of same.

22. PREPA shall include in the Quarterly Reports submitted pursuant to the Consent Decree the results of any OOR testing conducted during the preceding quarter pursuant to this Modification.

VI. NITROGEN OXIDE REDUCTION

23. PREPA shall reduce its Nitrogen Oxide ("NOx") emissions at its Palo Seco, Aguirre and South Coast Generating Units by implementing the NOx Program ("NOx Program") described in this Section for these Units. All NOx emission testing ("NOx Testing") shall be conducted in accordance with Appendix A. NOx Testing shall be performed to determine NOx emission baselines, to determine whether and to what extent NOx Optimization and/or Low NOx Modifications (as defined below) shall be performed, and to determine to what extent NOx reductions have been maintained. In conjunction with NOx Optimization and/or Low NOx Modification, optimal operating ranges ("OORs") for oxygen shall be verified where necessary

and, to the extent necessary, shall be modified pursuant to the Consent Decree. Air Compliance Status Reports, required pursuant to the Consent Decree Air Compliance Attachment Section C, shall include a report on activities conducted pursuant to the NOx Program.

24. Prior to, or within 180 days of the lodging of this Modification, PREPA shall conduct initial NOx Testing during representative operating conditions at its Palo Seco, Aguirre and South Coast Generating Units.

25. Upon completion of the NOx Testing referred to in Paragraph 24 above, the NOx emission baselines for the particular plant or group of Units subject to the NOx Program shall be calculated as follows:

(a) for each of the Palo Seco and Aguirre Plants, PREPA shall calculate a weighted average NOx emission rate, defined as the sum of the rated-capacity (in megawatts) of each individual Generating Unit subject to the NOx Program ("MWi") multiplied by the NOx emission rate (Ei) of that Unit (in lb/mmBtu), divided by the sum of the rated capacity of all such Units subject to this Program at each plant.

$$\text{Rated-capacity weighted average NOx emission rate} = \frac{\text{Ó } (MW_i \times E_i)}{\text{Ó } (MW_i)} \qquad \text{Eq. (1) ;}$$

(b) for South Coast Generating Units 1, 2, 3, and 4 ("Small Units"), PREPA shall calculate the weighted-average NOx emission rate, as defined as in Eq. (1), but with the denominator corresponding to the sum of the rated capacity (in megawatts) of the Small Units; and

(c) for South Coast Generating Units 5 and 6 ("Large Units"), PREPA shall calculate the weighted-average NOx emission rate, as defined as in Eq. (1), but with the denominator corresponding to the sum of the rated capacity (in megawatts) of the Large Units.

26. PREPA shall include, in the appropriate Air Compliance Status Reports, the NOx emission baselines established in accordance with Paragraph 25 above as well as a description of the representative operating conditions. This would include information regarding the fuel and

emissions conditions at each Unit at the time of the NOx Testing. In addition, on an ongoing basis, PREPA shall collect data related to the nitrogen content of its fuel supply by nitrogen testing of fuels in accordance with ASTM Method D4629. This data shall be made available to EPA, on-site, upon request, and made available to EPA within seven (7) days of an EPA written request made to the Head of the Environmental Protection Division of PREPA.

27. In addition to the initial NOx Testing referred to in Paragraph 24 above, the NOx Program shall consist of (a) operational adjustments, if required under Paragraph 28(a), performed in accordance with the optimization protocol attached as Appendix "B" ("NOx Optimization"), and (b) technically and economically reasonable physical changes to reduce NOx formation ("Low NOx Modifications"), if required under Paragraph 28(b). Low NOx Modifications shall include one or more physical changes, such as the installation of modified burner tips, nozzles or diffuser plates or other alterations of the fuel burner assemblies as may be necessary to comply with the provisions of Paragraph 28. Low NOx Modifications shall not include burner retrofitting and major modifications, such as complete burner assembly replacement, modifications which require extended outages that cannot be implemented during planned environmental outages or other modifications which can be demonstrated to be technically or economically unreasonable.

28. PREPA shall use its best efforts to attain NOx reductions ("NOx Reductions") in accordance with (a) and (b) below:

(a) NOx Optimization

PREPA shall perform NOx Optimization if the NOx emission baseline exceeds the thresholds ("NOx Emission Thresholds") provided below for that particular plant or group of Units:

Palo Seco	0.30 lbs/mmBtu
Aguirre	0.30 lbs/mmBtu

South Coast:

Small Units	0.30 lbs/mmBtu
Large Units	0.40 lbs/mmBtu

(b) Low NOx Modifications

If NOx Optimization conducted pursuant to (a) above does not result in NOx reductions that achieve the NOx Emission Thresholds specified for a particular plant or group of Units, PREPA shall either demonstrate that the particular plant or group of Units has/have attained the reductions ("NOx Percentage Reductions") specified below, or perform Low NOx Modifications at that particular plant or group of Units to attain the NOx Percentage Reductions specified below:

15% at Palo Seco Plant
15% at Aguirre Plant
15% at South Coast Plant Small Units
20% at South Coast Plant Large Units

29. Operating parameters affected by the NOx Optimization or Low NOx Modifications shall be incorporated into the OORs and operations manuals, as appropriate.

30. NOx Optimization, performed pursuant to Paragraph 28(a) shall be completed within 24 months of the lodging of this Modification. Low NOx Modifications, performed pursuant to Paragraph 28(b) shall be completed within 18 months of the completion of NOx Optimization.

31. Upon completion of NOx Optimization and/or Low NOx Modification for a particular plant or group of Units, as specified in Paragraph 28, NOx Testing shall be conducted to determine whether the NOx Emission Thresholds specified in Paragraph 28(a) or, in the alternative, whether the NOx Percentage Reductions specified in Paragraph 28(b) have been attained for that particular plant or group of Units.

32. Within sixty (60) days following completion of the NOx Testing conducted pursuant to Paragraph 31 above, PREPA shall submit a written report ("NOx Reduction Report")

which describes, for that particular plant or group of Units, any NOx Optimization and/or Low NOx Modifications performed pursuant to Paragraph 28. The NOx Reduction Report shall also include the results of NOx Testing conducted for that particular plant or group of Units pursuant to Paragraphs 24 and 31 above. In addition, if the NOx Emission Thresholds or the NOx Percentage Reductions specified in Paragraph 28 have not been attained, the NOx Reduction Report shall include an explanation as to why further NOx reduction measures were not performed.

33. Within ninety (90) days of submission of a NOx Reduction Report, PREPA shall conduct NOx Testing to determine whether the NOx Reductions attained pursuant to Paragraph 28 are relatively maintained ("Relatively Maintained"). If the NOx Reductions are Relatively Maintained, further periodic testing shall be conducted annually thereafter. As used in this Section, Relatively Maintained shall mean that the NOx Reductions for a particular plant or group of Units have been maintained within 8% (measured in lbs/mmBtu) of the NOx Emission Thresholds and/or NOx Percentage Reductions specified in Paragraph 28 or, if initially greater than those specified in Paragraph 28, within 8% of the NOx Reductions reported in the NOx Reduction Report.

34. If the NOx Testing conducted pursuant to Paragraph 33 indicates that the NOx Reductions reported in the NOx Reduction Report have not been Relatively Maintained, PREPA shall re-perform NOx Optimization in accordance with Appendix "B" and repeat NOx Testing in an effort to reestablish the NOx Reductions reported in the NOx Reduction Report within the margins established pursuant to Paragraph 33.

35. If, after any NOx Optimization conducted pursuant to Paragraph 34, PREPA is unable to demonstrate that it has Relatively Maintained the NOx Reductions at a particular plant or group of Units, PREPA shall:

(a) submit an engineering study to EPA which analyzes the technical reasons for being unable to have Relatively Maintained the NOx

Reductions at a particular plant or group of Units. Such analysis shall include a discussion of the economic and technical reasons that PREPA considered to determine whether NOx Reductions originally attained could be recaptured.

(b) conduct NOx Testing every six (6) months, and if the NOx Reductions originally attained have further deteriorated below the levels reported in the NOx Reduction Report, perform NOx Optimization pursuant to Paragraph 34 and report pursuant to Paragraph 35(a) every six (6) months thereafter until either:

1) the Consent Decree has terminated for every Unit considered in the particular plant or group of Units which have been unable to have Relatively Maintained NOx Reductions, or

2) PREPA can demonstrate that the originally attained NOx Reductions have been Relatively Maintained, in which case PREPA shall conduct annual NOx Testing pursuant to Paragraph 33.

36. Should safety or reliability factors prevent the prompt re-testing and/or re-optimization of Generating Units subject to the NOx Program, as required in Paragraphs 34 and 35, PREPA shall provide EPA with the reasons re-testing was prevented and an alternate schedule to complete these requirements for EPA's review and approval.

37. The NOx Program is not a Compliance Program, as defined by the Consent Decree. As such, notwithstanding Paragraph 35 above, compliance with the NOx Program for three years shall not be a precondition for granting a termination of the Consent Decree.

VII. FUEL USED FOR START UP

38. PREPA shall use diesel fuel (or number 2 fuel oil) during Cold Start Conditions at all oil-fired Generating Units at the San Juan, Palo Seco, Aguirre and South Coast facilities. For

the purpose of this Modification, a "Cold Start Condition" shall mean a boiler ignition in a Unit that has been off-line for 48 hours or longer.

39. PREPA shall commence using diesel fuel (or number 2 fuel oil) during Cold Start Conditions at each of its sixteen (16) oil-fired Generating Units subject to this Modification. The use of diesel fuel (or number 2 fuel oil) during Cold Start Conditions shall commence at ten (10) Generating Units by June 30, 2004, at two (2) Generating Units by December 31, 2004, and at the remaining four (4) oil-fired Generating Units by September 30, 2005.

40. PREPA shall report on the progress of this diesel fuel program in the Consent Decree Quarterly Report next following the commencement of the use of diesel fuel during Cold Start Conditions as scheduled above.

VIII. EMISSION REDUCTION CREDITS

41. EPA agrees to coordinate with PREPA to ensure that the commitments contained in Sections IV and VI above do not result in PREPA losing any emission reduction credits to which it would otherwise be entitled pursuant to applicable law.

42. Should PREPA seek credits for any emission reductions resulting from activities conducted pursuant to this Modification, EPA will coordinate with PREPA to ensure that the requirements to reduce those emissions are incorporated into a federally enforceable document which allows for emission credits if PREPA would, but for this Modification, be entitled to be considered for such credits.

IX. ADDITIONAL COMMITMENTS BY PREPA

43. Prior to any use by PREPA of a fuel oil with a sulfur content of greater than 0.50% at Palo Seco, PREPA shall provide public notification (i.e., newspaper notice) and direct notification to CUCCo (or any successor organization), of such proposed change. PREPA shall provide such notification at least thirty (30) days prior to implementing such change in fuel usage.

44. PREPA agrees to allow a reasonable number of CUCCo representatives to be

present as observers at significant activities involving the revision of the OORs required pursuant to Section V of this Modification, and to arrange meetings at which a reasonable number of CUCCo representatives and the Environmental Review Contractor ("ERC") may attend to discuss matters related to PREPA's compliance with the Consent Decree and this Modification. The number and identity of such representatives shall be subject to the approval of PREPA, which approval shall not be unreasonably withheld.

45. Public documents regarding matters related to PREPA's compliance with the Consent Decree shall be made readily available by the Head of the Environmental Protection Division of PREPA.

46. The ERC may request, and in such event PREPA agrees to provide to the ERC, in conformance with the provisions of Paragraphs 4 and 5 c. of Section XI (Environmental Review Contractor) of the Consent Decree, timely information regarding the use of residual fuel additives in its Units.

X. CIVIL PENALTY

47. Within thirty (30) days after entry of this Modification, PREPA shall pay a civil penalty of $300,000. If that amount is not timely paid, interest shall accrue on that amount commencing thirty (30) days after entry of this Modification and continuing until payment of that amount is made. Interest shall accrue at the rate provided for in 28 U.S.C. § 1961 ("Interest"). PREPA shall make payment by FedWire Electronic Funds Transfer ("EFT") in accordance with current EFT procedures and in accordance with written instructions to be provided by the United States Attorney's Office, Torre Chardón, 350 Carlos Chardón Street, San Juan, Puerto Rico 00918, referencing USAO File Number _____, EPA Region II, and DOJ Case Number 90-5-2-1-1750/2. The costs of such electronic funds transfer shall be the responsibility of PREPA.

XI. ENVIRONMENTAL REVIEW CONTRACTOR PROGRAM

48. Within thirty (30) days after entry of this Modification, PREPA shall deposit

$100,000 into the Environmental Review Contractor escrow account, as described in Section XI of the Consent Decree. If that amount is not timely deposited, interest shall accrue on that amount commencing thirty (30) days after entry of this Modification and continuing until that amount is deposited. Any accrued interest shall be deposited into the Environmental Review Contractor escrow account, as described in Section XI of the Consent Decree.

XII. LAND ACQUISITION PROJECT

49. Within thirty (30) days after the entry of this Modification, PREPA shall deposit $100,000 into the Land Acquisition Fund, as described in Section XII.C. of the Consent Decree. If that amount is not timely deposited, interest shall accrue on that amount commencing thirty (30) days after entry of this Modification and continuing until that amount is deposited. Any accrued interest shall be deposited into the Environmental Review Contractor escrow account, as described in Section XI of the Consent Decree.

XIII. STIPULATED PENALTIES

50. PREPA shall pay stipulated penalties to the United States for any violations of this Modification, as set forth below.

51. For each Unit of PREPA's South Coast and Aguirre Plants, the stipulated penalty for each visible emissions opacity violation and each continuous emission monitor opacity violation shall be increased from the levels in Paragraph 68 of the Consent Decree to the levels listed in the following two tables until March 1, 2007 or the date when PREPA has installed and is operating pollution control equipment at the Unit in question such that PREPA achieves Consistent Compliance, as determined in accordance with Paragraph 15 hereof, with the requirements of Rule 403, whichever is earlier. After that date, the stipulated penalties applicable to opacity violations at the Unit in question shall revert to those levels contained in Paragraph 68 of the Consent Decree.

STIPULATED PENALTY APPLICABLE TO VIOLATION(S) OF RULE 403(a) OF THE PRRCAP DETECTED BY CONTINUOUS EMISSIONS MONITORS

Six-Minute Periods at > 20% to 40% Opacity	Six-Minute Periods at > 40% to 60% Opacity	Six-Minute Periods at > 60% Opacity	Penalty Amount Per Six-Minute Period
The first through tenth six-minute periods in any single day	The first through fourth six-minute periods in any single day	The first six-minute period in any single day	$300
The eleventh through eighteenth six-minute periods in any single day	The fifth through ninth six-minute periods in any single day	The second through fourth six-minute periods in any single day	$900
The nineteenth and beyond six-minute periods in any single day	The tenth and beyond six-minute periods in any single day	The fifth and beyond six-minute periods in any single day	$1500

STIPULATED PENALTY APPLICABLE TO VIOLATION(S) OF RULE 403(A) OF THE PRRCAP DETECTED BY METHOD 9 VISIBLE EMISSIONS READINGS

Six-Minute Periods at > 20% to 40% Opacity	Six-Minute Periods at > 40% to 60% Opacity	Six-Minute Periods at > 60% Opacity
The first through tenth six-minute periods in any single day:	The first through fourth six-minute periods in any single day:	The first six-minute period in any single day:
$300 penalty amount per six-minute period	$450 penalty amount per six-minute period	$600 penalty amount per six-minute period
The eleventh and beyond six-minute periods in any single day:	The fifth and beyond six-minute periods in any single day:	The second and beyond six-minute periods in any single day:
$1000 penalty amount per six-minute violation	$1200 penalty amount per six-minute period	$1400 penalty amount per six-minute period

52. The United States and PREPA agree that the above listed stipulated penalties will apply to each visible emission opacity violation and each continuous emission monitor opacity violation, with the exception of those violations subject to the consequences as set forth in the following sentence. The United States reserves its right to seek any penalty, remedy or sanction for visible emission opacity violation(s) and continuous emission monitor opacity violation(s) that, due to the nature, extent, duration, or severity of the violation(s), cannot reasonably be subject to stipulated penalties only. If the United States seeks statutory civil penalties for any opacity violation subject to the above stipulated penalties, PREPA shall be entitled to a reduction

in any statutory civil penalty assessed by the same amount paid in stipulated penalties for the same violation.

53. For any failure to: pay the Civil Penalty ($300,000) plus any Interest as required by Paragraph 47; deposit $100,000 plus any Interest into the Environmental Review Contractor escrow account as required by Paragraph 48; or deposit $100,000 plus any Interest into the Land Acquisition Fund as required by Paragraph 49, PREPA shall pay a stipulated penalty in the following amount for each day during which any payment is not made:

Period of Failure To Comply	**Penalty Per Violation Per Day**
1st through 30th day	$2,000
31st and beyond	$5,000

54. For each failure of a Generating Unit to timely comply with the requirements of this Modification pertaining to revising and, if necessary, modifying OORs, PREPA shall pay a stipulated penalty in the following amount for each day during which each violation occurs:

Period of Failure To Comply	**Penalty Per Violation Per Day**
1st through 30th day	$750
31st through 60th day	$1,250
61st and beyond	$1,750

55. Stipulated penalties shall be payable to the United States per violation per day for the following:

Reporting Violations:

(a) failure to submit nitrogen in fuel content data as required by Paragraph 26 of this Modification; and

(b) failure to submit the engineering study required by Paragraph 35(a) of this Modification.

Operating Range Violations:

(c) failure to incorporate operating parameters into OORs and operations manuals in accordance with Paragraph 29 of this Modification.

Period of Failure To Comply	Penalty Per Violation Per Day
1st through 15th day	$100
16th through 60th day	$200
61st and beyond	$500

56. Stipulated penalties shall be payable to the United States per violation per day for the following:

Reporting Violations:

(a) failure to submit the NOx Reduction report in accordance with Paragraph 32 of this Modification; and

(b) failure to submit baseline NOx emission data required by Paragraph 26 of this Modification.

Periodic Testing Violations:

(c) failure to comply with periodic testing obligations in accordance with Paragraphs 31, 33, 34, and 35(b) of this Modification.

Period of Failure To Comply	Penalty Per Violation Per Day
1st through 15th day	$200
16th through 60th day	$500
61st and beyond	$800

57. Stipulated penalties shall be payable to the United States per violation per day for the following:

(a) failure to conduct initial NOx Testing in accordance with Paragraph 24 of this Modification;

(b) failure to perform NOx Optimization in accordance with Paragraph 28(a) of this Modification;

(c) failure to perform NOx Modifications in accordance with Paragraph 28(b) of this Modification; and

(d) failure to complete NOx Optimization or Modification in accordance with Paragraph 30 of this Modification.

Period of Failure To Comply	Penalty Per Violation Per Day
1st through 15th day	$500
16th through 60th day	$1,000
61st and beyond	$1,500

58. For each Generating Unit that fails to timely comply with the requirements of this Modification pertaining to the commencement of the use of diesel fuel (or number 2 fuel oil) during Cold Start Conditions by June 30, 2004, December 31, 2004 or September 30, 2005 (as the case may be), PREPA shall pay a stipulated penalty in the following amount:

Period of Failure To Comply	Penalty Per Violation Per Day
1st through 30th day	$500
31st through 60th day	$1,000
61st and beyond	$2,000

59. For each separate failure of a Generating Unit to timely comply with the requirements of this Modification pertaining to the use of diesel fuel (or number 2 fuel oil) during discrete start ups under Cold Start Conditions, PREPA shall pay a stipulated penalty in the amount of $1,000 for such violation at such Generating Unit.

60. For each failure of a Generating Unit to timely comply with the requirements of this Modification pertaining to Fuel Oil Sulfur Content contained in Paragraphs 10, 14, 16 and 17, above, PREPA shall pay a stipulated penalty in the following amount for each day during which the violation occurs:

Period of Failure To Comply	Penalty Per Violation Per Day
1st through 30th day	$1,500
31st through 60th day	$3,000
61st and beyond	$5,000

61. The Parties agree that any violations of Rule 403 or the Consent Decree resulting from the revision of OORs, and any violations of Rule 403 or the Consent Decree resulting from Performance Testing of Pollution Control Equipment, shall not be subject to any stipulated

penalties under this Modification or the Consent Decree. However, during such time periods the United States reserves its right to seek civil penalties.

62. Stipulated penalty payments to the United States shall be made, within thirty (30) days of the demand, by EFT referencing USAO File Number _____, EPA Region II, and DOJ Case Number 90-5-2-1750/2. The EFT shall be made in accordance with current EFT procedures and in accordance with written instructions to be provided by the United States Attorney's Office, Torre Chardón, 350 Carlos Chardón Street, San Juan, Puerto Rico 00918. The costs of such electronic funds transfer shall be the responsibility of PREPA. All stipulated penalties begin to accrue on the day after performance is due or on the day a violation occurs, and continue to accrue through the final day of all corrections of the noncompliance. Stipulated penalties accrue even if no demand is made, but need not be paid until a demand is made. Payments shall be made within thirty (30) days of the demand. In the event that a stipulated penalty payment is not made on time, such penalty shall be subject to interest at the statutory judgment rate set forth at 28 U.S.C. § 1961, for each day of late payment or non-payment. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Modification. Notwithstanding any other provision of this Section, the provisions of Paragraph 40 of the Consent Decree shall have full application to all stipulated penalties to which PREPA may be subject under this Modification, with the exception of any stipulated penalties to which PREPA may be subject under Paragraph 60 hereof.

63. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive payment of any portion of the stipulated penalties that have accrued pursuant to this Modification.

64. Except as specifically described in this Modification, nothing in this Modification shall be construed as prohibiting, altering or in any way limiting the ability of the United States to seek any other remedies or sanctions available by virtue of PREPA's violation of this Modification or the Consent Decree or of the statutes and regulations upon which the Consent

Decree and this Modification is based, or for PREPA's violation of any applicable provision of law.

65. Notwithstanding the stipulated penalty provisions above, for any violation of the requirements of this Modification pertaining to Sections III (Method 9 Opacity Readings) and IV (Fuel Oil Sulfur Content), the United States reserves all of its rights and remedies, including, but not limited to, the rights and remedies to seek enforcement of this Modification's requirements through civil contempt proceedings or other proceedings, and the right to request assessment of civil penalties and/or damages for violation of the requirements of this Modification.

66. PREPA may seek dispute resolution, pursuant to the Consent Decree (as modified by Section XV below), of any dispute that arises under this Modification or the Consent Decree, including but not limited to disputes relating to demands by the United States for payment of stipulated penalties under this Modification.

XIV. NON-WAIVER PROVISIONS

67. This Modification does not limit any rights or remedies available to the United States for any violation by PREPA of the Consent Decree, or Federal and Commonwealth laws and regulations, except as specifically described in this Modification.

68. This Modification does not limit any rights or remedies available to the United States for any criminal violations.

69. The United States expressly reserves all rights and remedies available to it for all violations by PREPA of this Modification. The United States contends that these rights and remedies include, but are not limited to, the right to seek enforcement of the provisions of this Modification through civil contempt proceedings or other proceedings, and the right to request assessment of civil penalties and/or damages for violations of this Modification.

70. Nothing herein shall be construed to limit the power of the United States, consistent with its authority, to undertake any action against any person, in response to conditions

which may present an imminent and substantial endangerment to the public health, welfare, or the environment.

71. Nothing herein shall be construed to impact, limit, expand or affect the authority of EPA to issue permits, or to create any obligation upon EPA to issue any permit. Additionally, nothing herein shall be construed as creating any permit condition or permit right for PREPA.

72. Nothing in this Modification constitutes or shall be interpreted as an admission of any fact, law, or past violation of the Consent Decree or law.

XV. DISPUTE RESOLUTION

73. The Parties agree that Section XV (Dispute Resolution) of the Consent Decree shall be amended as follows:

A. Paragraph 97 of the Consent Decree is hereby amended to provide that PREPA shall have forty-five (45) days from the date of the conclusion of the informal negotiation period within which to file a petition with the Court, rather than fifteen (15) days as originally provided in Paragraph 97.

B. Paragraph 97 of the Consent Decree is hereby further amended by the addition of the following sentence at the end of that Paragraph: "The Court shall decide all disputes pursuant to applicable principles of law for resolving such disputes. In their initial filings with the Court under this Paragraph 97, the Parties shall state their respective positions as to the applicable standard of law for resolving the particular dispute."

C. The reference in Paragraph 99 of the Consent Decree to fifteen (15) days is hereby amended to refer to forty-five (45) days.

XVI. COSTS

74. Each party shall bear its own costs and attorney's fees for the matters resolved by this Modification.

XVII. RETENTION OF JURISDICTION

75. This Modification is incorporated into the Consent Decree. The Court has and shall retain jurisdiction as provided in Paragraphs 30 and 133 of the Consent Decree.

XVIII. PUBLIC COMMENT

76. This Modification shall be lodged with the Court for a period of not less than thirty (30) days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold consent if the comments regarding this Modification disclose facts or considerations indicating that this Modification is inappropriate, improper, or inadequate. PREPA consents to the entry of this Modification without further notice.

DATED: _____

_____
CARMEN CONSUELO CEREZO
UNITED STATES DISTRICT JUDGE

FOR PLAINTIFF, UNITED STATES,

DATED: 6.18.04

THOMAS L. SANSONETTI
Assistant Attorney General
Environment & Natural Resources Division
United States Department of Justice

DATED: 6/18/04

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DATED: June 16, 2004

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DATED: 6/17/04

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FOR DEFENDANT, PUERTO RICO POWER AUTHORITY,

DATED: 06-21-04

APPENDIX A - NOx TESTING

NOx Testing and Analytical Methods

1. Instrumentation

Oxides of nitrogen will be measured in the stack effluent gas from each of the units tested following EPA Method 7E, which is the Instrumental Analyzer Procedure. This test method references EPA Method 6C (the Instrumental Analyzer Procedure for measuring Sulfur Dioxide Emissions from Stationary Sources). Method 6C defines the instrument sensitivity, calibration drift (<3% of the span), zero drift (<3% of the span), sampling system bias (<5% of the span), analyzer calibration error (<2% of the span), sampling system design and operation.

For these tests, a stainless steel probe (3/8" outside diameter) will be inserted to a point close to the center of the stack being tested. A stainless steel sintered filter will be attached to the end of the probe inside the stack, enabling particulate matter in the flue gas sample to be filtered before entering the probe. The sample will be extracted through the probe directly into a glass condenser bottle immersed in an ice water bath. The length of probe outside the stack will be approximately 3 feet to 4 feet, and need not be heat traced or insulated. The flue gas temperature inside the stacks tested is typically greater than 300°F and the residence time of the sample inside the unheated section of probe should be less than 1 second. Therefore, it is unlikely that the water dew point of the sample, approximately 123°F, would be reached before the sample entered the condenser bottle. The sample probe enters the 8 inch tall condenser bottle at approximately 2 inches. Thus, the flue gas sample is never allowed to bubble through condensed water at any time. The condenser bottle shall be emptied of all condensate after about 4 hours of sampling.

From the condenser bottle, the flue gas sample will be pulled through approximately 100 feet of polyethylene tubing to the analyzer trailer located on ground level. Before entering the analytical instrumentation, the flue gas sample passes through a Balston micro-fiber filter and another refrigeration condenser (secondary filtration and moisture removal) and then a ball float rotometer to monitor and maintain constant sample flow. The flue gas sample then goes to a diaphragm pump and then to a distribution manifold where it is distributed to the analytical instruments.

For this program, the following equipment will be used: a Thermoelectron Chemi-luminescent analyzer (for measuring NO_x), a Servomex zirconium oxide oxygen analyzer and a Servomex non-dispersive infra-red carbon dioxide analyzer. These instruments will be connected to a multiplexor which, in turn, is connected to a computer. This system serves as a data acquisition system. During this test program, the data acquisition system collects data at 2 second increments for some tests and 10 second increments for other tests. Samples are analyzed for 5 minute periods, so there are between 30 data points and 150 data points collected and recorded from each sample location for each
sampling period. The oxygen content and carbon dioxide content of the flue gas sample will be determined by EPA Method 3A, instrument analyzer procedure. A quality control check on this procedure will be used following EPA Method 3B. Method 3B utilizes a fuel factor, F_o, to evaluate the validity of flue gas analysis data where both O_2 and CO_2 are measured. The fuel factor is defined as follows:

$$F_o = \frac{(20.9 - \%\ O_2)}{\%\ CO_2}$$

Where % O_2 and % CO_2 are the O_2 and CO_2 measured in the flue gas sample, respectively. The value of F_o, as determined by the equation above, should lie between 1.210 and 1.370 for combustion facilities burning a typical residual fuel oil.

Before each test, each analyzer is calibrated by first passing zero grade nitrogen through the instruments. Next, a span gas of approximately 80% of full span is passed through each instrument. Finally, a mid-range QC gas is passed through each instrument. At the end of a test run, the zero and span of each instrument is again checked. In all cases, the zero and span

should be within the 3% tolerance allowed by the test method.

Prior to the start of testing of each unit, zero and span gas is sent to the sampling location and passed through the entire sampling system to determine if there are any sampling system leaks or sampling system bias. This procedure also allows for the system response time to be determined. The system response time is nominally approximately 40 to 60 seconds for complete instrument response.

2. Calibration Gases

The calibration gases to be used during this test program are shown in Table 2-1. All of these calibration gases are certified EPA Protocol Gas Mixtures.

Table 2-1. Calibration Gases - PREPA NO_x Baseline Test Program

Calibration Gas	Certified Concentration	Instrument Range	Purpose of Calibration Gas
Zero Grade Nitrogen	99.98%		Zero
Oxygen/ Carbon Dioxide	8.03% O_2 /15.2% CO_2	10 % O_2, 20% CO_2	Span
Oxygen	6.06%	10 % O_2	QC
Oxygen/Carbon Dioxide	5.06% O_2, 5.01% CO_2	10 % O_2, 20% CO_2	QC
Oxides of Nitrogen	407 ppm NO, 1 ppm NO_2	500 ppm	Span
Oxides of Nitrogen	219 ppm NO, 1.2 ppm NO_2	500 ppm	QC
Carbon Monoxide	~ 450 ppm	500 ppm	Span
	~200 ppm	500 ppm	QC

3. Test Procedures

For this test program, flue gas samples are to be extracted from the stack(s) of the unit being tested for at least one hour. Many of the units tested have two stacks. For those units having two stacks, a flue gas sample will be pulled from one stack for 6 minutes, with data being collected for 5 minutes following a 1 minute sampling system purge. Then a sample will be pulled from the other stack for 6 minutes with data collection for 5 minutes following a 1 minute purge. This process is continued for a minimum of 6 cycles (i.e. each stack being sampled for 6 – 6 minute segments, or a total time of 1 hour 12 minutes). The data acquisition system collects data during the 5 minute sampling segments at either 2 second or 10 second increments, resulting in between 30 and 150 data points per stack sampling cycle, and a total of between 180 and 900 data points for each test.

Each unit will be tested at three loads: maximum achievable load; normal reduced load and an intermediate load. Because the PREPA electrical system is not part of an electrical grid, typically it is necessary for the units to operate in frequency following mode, which requires the unit loads to fluctuate to follow demand. Usually, the daytime demand is close to full load on most units, while the typical minimum load on the units occurs at night and is close to 70% of maximum capacity. Because of the small difference between full load and normal reduced load, it is expected that NOx emissions will exhibit linearity across the range of tested loads. Initial baseline sampling has already been conducted using two loads, instead of three, at the following units: Palo Seco 2, Palo Seco 3, Palo Seco 4, Aguirre 2, South Coast 1, South Coast 2, South Coast 5 and South Coast 6. The remaining units shall be tested under three loads, as discussed above. Data from the two-load and three-load tests shall be compared and, should the data exhibit a non-linear or non-quadratic character such that extrapolation from a two-load data set is non-representative, PREPA, in consultation with EPA, may conduct additional baseline sampling to collect more representative data.

4. Data Analysis and Calculation Methodology

For this test program, each recorded NO_x measurement (2 second or 10 second interval) will be converted to the equivalent pounds of NO_2 per million Btu basis (Lb/MMBtu). This will be done by using the EPA Method 19 "F" factor calculation and using the O_2 measured as the flue gas sample diluent determination. The F-factor calculation is based on the fact that 1 million Btu of a fuel in a particular fuel class (such as natural gas, fuel oil, Bituminous Coal, etc.) produces a known quantity of flue gas at zero excess air. For the case of residual fuel oil, 9190 dry standard cubic feet of flue gas results from the combustion of 1 million Btu of fuel, at zero excess air. The following formula will be used in this calculation.

NO_2, lb/MMBtu = C_d X F_d X (20.9/(20.9-O_2))

where:C_d = ppm NO_x (dry) X Conversion Factor (1.194 X 10^{-7}) (lb/scf)/ppm;

F_d = dry standard cubic feet of flue gas per 10^6 Btu (9190 dscf/10^6 Btu for oil);

O_2 = sample O_2 (% dry).

This calculation does not require any flow rates; only the NO_x and O_2 measured by the sampling system and the applicable F-factor.

If it is desired to calculate a mass emission rate of NO_x, the preferable approach is to use the fuel flow, in pounds per hour, multiplied by the higher heating value of the fuel oil, approximately 18,500 Btu/lb, multiplied by the NO_2, lb/MMBtu. This is shown in the following equation.

NO_2, Lb/Hr = NO_2 (Lb/MMBtu) X Fuel Flow (Lb/Hr) X HHV (Btu/Lb Fuel) X $1/10^6$

Previous tests for determining boiler efficiency and performance on the PREPA units have shown that the fuel flow meter is consistently accurate (+/- 2%). The higher heating value of the fuel is typically determined by a laboratory analysis of a fuel oil sample, normally done on a frequent basis (each fuel delivery).

In addition to the data collection and analysis method described above, PREPA shall collect data relating to fuel additive usage (including the type of additive and any increase in the frequency or quantity of such use),CO emissions and opacity during the sampling period. Also, fuels data, including N content (ASTM Method D 4629), S content (ASTM Method 4294 or D1552) and HHV (ASTM Method D240), relevant to each test period shall be reported with the test data. In conjunction with Appendix B-NOx Optimization, PREPA shall adjust its Optimal Operating Ranges ("OORs")for NOx minimization to the extent that such adjusted parameters are complementary of the OORs and do not otherwise impact unit performance.

APPENDIX B - NOx OPTIMIZATION

COMBUSTION TUNING FOR NO_x OPTIMIZATION ON PREPA STEAM GENERATORS

The following table outlines a procedure to be followed to optimize steam generators in the PREPA system. It is noted that the test conditions indicated in the attached table are very general because the boilers in the PREPA system differ in some design features. Therefore, for some units the parametric variations could expand or be reduced from that shown.

The information shown in the attached table is intended as a guide only. In most cases, as the combustion tuning optimization proceeds, certain operating conditions for reducing NO_x become apparent and, therefore, some operating conditions indicated in the table would be excluded and, perhaps, some not included in the table might be investigated (such as partial burner elevations out of service). In most cases, it is not necessary to investigate all of the test conditions indicated in the attached table.

Throughout the combustion tuning activity, flue gas measurements for NO_x, O_2, and CO will be made continuously. In addition, visible emission performance shall be monitored and, in conjunction with the OOR program, Method 9 readings shall be taken to verify compliance with Rule 403. Also, boiler performance will be monitored during the testing. Boiler performance issues that will be considered include: flame appearance, steam temperatures, boiler efficiency, etc.

In general, each test condition typically takes 60 to 90 minutes to fully set-up and test. Therefore, the process of comprehensive combustion tuning can take 6 to 10 days to complete, depending on how many test conditions are necessary to completely map the NO_x characteristics.

The parametric variations table below only address full load operation. Reduced load combustion tuning must also be conducted, but is customarily less intensive because what is learned during the full load testing can be applied to reduced load testing. Once optimal parameters are determined, they will be applied over several loads to ensure low NOx performance across the range of expected operating conditions.

Typical combustion tuning procedure for NOx optimization

Boiler/Combustion Settings

Test	Load	O2 Level	Windbox to Furnace dP	Burners OOS	Upper Air Damper Pos.	Middle Air Damper Pos.	Lower Air Damper Pos,	Atomizing Steam Pr.	Avg. CET
1	Full	Normal	Normal	0	Normal	Normal	Normal	Normal	Normal
2	Full	High	Normal	0	Normal	Normal	Normal	Normal	Normal
3	Full	Low	Normal	0	Normal	Normal	Normal	Normal	Normal
4	Full	Normal	Normal	0	Normal	Normal	Normal	Normal	Normal
5	Full	Normal	High	0	Normal	Normal	Normal	Normal	Normal
6	Full	Normal	Low	0	Normal	Normal	Normal	Normal	Normal
7	Full	High	High	0	Normal	Normal	Normal	Normal	Normal
8	Full	Low	High	0	Normal	Normal	Normal	Normal	Normal
9	Full	High	Low	0	Normal	Normal	Normal	Normal	Normal
10	Full	Low	Low	0	Normal	Normal	Normal	Normal	Normal
11	Full	Normal	Normal	0	More	Normal	Normal	Normal	Normal
12	Full	Normal	Normal	0	Less	Normal	Normal	Normal	Normal
13	Full	Low	Normal	0	More	Normal	Normal	Normal	Normal
14	Full	High	Normal	0	More	Normal	Normal	Normal	Normal
15	Full	Low	High	0	More	Normal	Normal	Normal	Normal
16	Full	High	High	0	More	Normal	Normal	Normal	Normal
17	Full	Low	Low	0	More	Normal	Normal	Normal	Normal
18	Full	High	Low	0	More	Normal	Normal	Normal	Normal
19	Full	Low	High	0	Less	Normal	Normal	Normal	Normal
20	Full	High	High	0	Less	Normal	Normal	Normal	Normal
21	Full	Low	Low	0	Less	Normal	Normal	Normal	Normal
22	Full	High	Low	0	Less	Normal	Normal	Normal	Normal
23	Full	Normal	Normal	0	Normal	More	Normal	Normal	Normal
24	Full	Normal	Normal	0	Normal	Less	Normal	Normal	Normal
25	Full	Normal	Normal	0	Normal	Normal	More	Normal	Normal
26	Full	Normal	Normal	0	Normal	Normal	Less	Normal	Normal
27	Full	Normal	Normal	0	Normal	Normal	Normal	Higher	Normal
28	Full	Normal	Normal	0	Normal	Normal	Normal	Lower	Normal
29	Full	Normal	Normal	0	Normal	Normal	Normal	Normal	Higher
30	Full	Normal	Normal	0	Normal	Normal	Normal	Normal	Lower
31	Full	Optimal	Optimal	0	Optimal	Optimal	Optimal	Optimal	Optimal
32	Full	Normal	Normal	Top Elev	Closed	Normal	Normal	Normal	Normal
33	Full	Normal	Normal	Top Elev	Open	Normal	Normal	Normal	Normal
34	Full	High	High	Top Elev	Open	Normal	Normal	Normal	Normal
35	Full	Low	High	Top Elev	Open	Normal	Normal	Normal	Normal
36	Full	High	Low	Top Elev	Open	Normal	Normal	Normal	Normal
37	Full	Low	Low	Top Elev	Open	Normal	Normal	Normal	Normal
38	Full	High	High	Top Elev	Closed	Normal	Normal	Normal	Normal

39	Full	Low	High	Top Elev	Closed	Normal	Normal	Normal	Normal
Test	Load	O2 Level	Windbox to Furnace dP	Burners OOS	Upper Air Damper Pos.	Middle Air Damper Pos.	Lower Air Damper Pos,	Atomizing Steam Pr.	Avg. CET
40	Full	High	Low	Top Elev	Closed	Normal	Normal	Normal	Normal
41	Full	Low	Low	Top Elev	Closed	Normal	Normal	Normal	Normal
42	Full	Optimal	Optimal	Top Elev	Optimal	Normal	Normal	Normal	Normal
43	Full	Normal	Normal	Mid Elev	Normal	Closed	Normal	Normal	Normal
44	Full	Normal	Normal	Mid Elev	Normal	Open	Normal	Normal	Normal
45	Full	High	High	Mid Elev	Normal	Open	Normal	Normal	Normal
46	Full	Low	High	Mid Elev	Normal	Open	Normal	Normal	Normal
47	Full	High	Low	Mid Elev	Normal	Open	Normal	Normal	Normal
48	Full	Low	Low	Mid Elev	Normal	Open	Normal	Normal	Normal
49	Full	High	High	Mid Elev	Normal	Closed	Normal	Normal	Normal
50	Full	Low	High	Mid Elev	Normal	Closed	Normal	Normal	Normal
51	Full	High	Low	Mid Elev	Normal	Closed	Normal	Normal	Normal
52	Full	Low	Low	Mid Elev	Normal	Closed	Normal	Normal	Normal
53	Full	Optimal	Optimal	Mid Elev	Normal	Optimal	Normal	Normal	Normal
54	Full	Normal	Normal	Low Elev	Normal	Normal	Closed	Normal	Normal
55	Full	Normal	Normal	Low Elev	Normal	Normal	Open	Normal	Normal
56	Full	High	High	Low Elev	Normal	Normal	Open	Normal	Normal
57	Full	Low	High	Low Elev	Normal	Normal	Open	Normal	Normal
58	Full	High	Low	Low Elev	Normal	Normal	Open	Normal	Normal
59	Full	Low	Low	Low Elev	Normal	Normal	Open	Normal	Normal
60	Full	High	High	Low Elev	Normal	Normal	Closed	Normal	Normal
61	Full	Low	High	Low Elev	Normal	Normal	Closed	Normal	Normal
62	Full	High	Low	Low Elev	Normal	Normal	Closed	Normal	Normal
63	Full	Low	Low	Low Elev	Normal	Normal	Closed	Normal	Normal
64	Full	Optimal	Optimal	Low Elev	Normal	Normal	Optimal	Normal	Normal
65	Full	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal	Optimal